

**Environmental Liability Directive (ELD)
STAKEHOLDER WORKSHOP**

Case studies assessed by ISPRA under ELD National Legislation

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CASE STUDY 1

Groundwater damage

Diffusion of perchlorethylene (PCE) in GWB from industrial site

INTENTIONAL SPILLAGE OF PCE – Damaging occurrence, Damage factors, Adverse effects

- ✓ **Intentional spillage of halogenated solvents**
- ✓ **Extensive pollution by PCE of the deep aquifer used for water supply**
- ✓ **Contamination still ongoing, secondary source not yet eliminated/isolated**
- ✓ **Ineffectiveness of the intervention in containing contamination within the site**

Almost 14 Km² of territory and 42.000.000 m³ of contaminated GWB

Diffusion of perchlorethylene (PCE) in GWB from industrial site

INTENTIONAL SPILLAGE OF PCE – Damage under ELD

- ✓ **Non-compliance** with **drinking water limits** and **threshold values** for the GWB good chemical status
- ✓ **Baseline** condition of GWB **available**
- ✓ **Partialisation** of the GWB
- ✓ **Decay of the chemical status** and **loss** of the aquifer for **drinking** purposes

Groundwater Damage + Interim loss of water supply services + Threat of further GW damage

Complementary (Primary not feasible) + Compensatory remediation + Preventive measures of further damage

Diffusion of perchlorethylene (PCE) in GWB from industrial site

REMARKS

- ✓ **High risk of GWD for continuous and long-term contamination**
- ✓ **Too much time needed to assess and remediate GWD**
- ✓ **Primary remediation of deep aquifers too complicated for DNAPL**
- ✓ **Key role of coordination among competent authorities for WFD/GWD/IED enforcement and police officers, prosecutors**
- ✓ **Risk based assessments and preventive measures for reducing the risk of groundwater damage by Annex III activities**

CASE STUDY 2

Surface water and biodiversity damage

Outflow of sediments from a dam during emergency spillage

EMERGENCY SPILLAGE OF A DAM – Damaging occurrence, Damage factors, Adverse effects

- ✓ **Uncontrolled spillage** of a dam
- ✓ Accumulation of **significant quantities of sediments** (Creek and River)
- ✓ **Significant growth of water turbidity**
- ✓ **Alteration of the river morphology and habitat** (about 6 km)
- ✓ **Death of about 1 ton of fish, including 5 protected species**

Outflow of sediments from a dam during emergency spillage

EMERGENCY SPILLAGE OF A DAM – Damage under ELD

Surface water + Biodiversity damage

- ✓ **Baseline** of ecological status and species **available**
- ✓ **Deterioration of the ecological status** of the surface water bodies for about 6 months
- ✓ **Zeroing and/or reduction of density** for 5 protected species including **recovery/recolonization difficulties** for the conditions of the torrential bed
- ✓ **Temporary loss** of ecosystem services: **supporting** services for biodiversity, **regulating** services and **recreational** services

Protected species

- 1) *Barbus caninus*
- 2) *Cobitis bilineata*
- 3) *Rutilus rubilio*
- 4) *Telestes muticellus*
- 5) *Cottus gobio*

Primary + Compensatory remediation

Outflow of sediments from a dam during emergency spillage

REMARKS

- ✓ Key role of **quick intervention** of local authorities for **environmental data collection**
- ✓ Baseline condition available for **previous monitoring of the aquatic species and ecosystem**
- ✓ **Too much time needed for claiming** environmental liability and remedial measures **through the legal procedure**
- ✓ **Relevant number of monitoring activities** to determine the water and biodiversity damage

CASE STUDY 3

Land damage

Biogas contamination from improper dumping

IMPROPER DISPOSAL OF WASTE - Damaging occurrence, Damage factors, Adverse effects

- ✓ **Improper disposal of industrial waste** (foundry slag and "mixed" waste) in an old quarry
- ✓ **Biogas and other hazardous substances in soil** (soil gas) in residential and commercial areas
- ✓ **Remediation measures still in progress**

Biogas contamination from improper dumping

IMPROPER DISPOSAL OF WASTE – Damage under ELD

- ✓ Soil gas concentrations within the range of explosivity of methane
- ✓ Very high concentrations of organohalogen compounds and aromatic compounds
- ✓ Migration of biogas to the surrounding residential and commercial areas outside the industrial site
- ✓ Concentrations of biogas and substances (COV) generating a significant risk to human health

Land Damage + Imminent threat of further damage

Primary remediation (still ongoing)

Biogas contamination from improper dumping

REMARKS

- ✓ **Historical industrial contaminated site** and related **improper waste disposal**
- ✓ **Assessment under ELD was requested pursuing art. 12** by the municipality
- ✓ **The only responsible party** for the reclamation of the area **is the old operator of the industrial site**
- ✓ **New residential and commercial areas** in the vicinity
- ✓ **Forced biogas extraction**, filtering and destruction plants as emergency safety containment measures to protect residents
- ✓ **Frequent monitoring campaigns** required to control effectiveness of the containment system
- ✓ **The risk of explosion** made the assessment on risk to human health faster

CASE STUDY 4

Biodiversity damage

Reduction of population of a protected species

ILLEGAL PICKING OF DATE MUSSEL - Damaging occurrence, Damage factors, Adverse effects

- ✓ **Illegal picking and trade of the protected species *Lithophaga lithophaga* (date mussel)**
- ✓ **Reduction of the population of the species on marine coast environment for several kilometers**
- ✓ **Reduction of habitat for other species (date mussel is an umbrella species)**
- ✓ **Alteration of biological communities associated with the species (date mussel is an umbrella species) and the marine ecosystem in general of the cliff environments**

Protected under Bern and Barcelona Conventions, included in Annex IV of Habitats Directive and subject to Annex II to the Washington Convention (C.I.T.E.S.).

Reduction of population of a protected species

ILLEGAL PICKING OF DATE MUSSEL — Damage under ELD

- ✓ **Baseline condition** represented by intact areas adjacent to those damaged
- ✓ **Significant** and effectively measured **impairment of the population** of the species *Lithophaga lithophaga* (natural recovery in 20-60 years)
- ✓ **Structural and functional alteration** of the entire ecosystem due to loss of ecosystem service (natural recovery in more than a century)
- ✓ **Costly restoration** by transplantation **not relevant or successful**

Monitoring activities, conducted by means of series of diving activities over 4 months, on 30 sites

Illegal picking and trade of the protected species

REMARKS

- ✓ Non Annex III activity, no «occupational activity» involved but **«activity» of criminal organisation** with manifest misconduct
- ✓ **Restoration of the populations of *Lithophaga lithophaga*** must take place **naturally** and it is very long
- ✓ **Periodic monitoring is needed** to assess the progress of recolonisation by the species and any disturbing factors which may hinder its correct natural recovery
- ✓ **Primary remediation through long lasting monitoring** to be conducted by specialised experts of the competent authority
- ✓ **Complex allocation of costs** (different subjects involved) for remediation compensation

THANKS FOR YOUR ATTENTION!

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